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US3

No. 6.034.507



US006034507A

United States Patent [19]

Ikawa et al.

[11] **Patent Number:** 6,034,507[45] **Date of Patent:** *Mar. 7, 2000[54] **ELECTRIC VEHICLE WITH SECONDARY BATTERY POWER STORAGE SYSTEM**[75] **Inventors:** Kyoko Ikawa; Tatsuo Horiba, both of Hitachi, Japan[73] **Assignee:** Hitachi, Ltd., Tokyo, Japan[*] **Notice:** This patent is subject to a terminal disclaimer.[21] **Appl. No.:** 09/134,708[22] **Filed:** Aug. 14, 1998**Related U.S. Application Data**

[63] Continuation of application No. 08/606,226, Feb. 23, 1996, which is a continuation of application No. 08/363,372, Dec. 23, 1994, abandoned.

[30] **Foreign Application Priority Data**

Dec. 27, 1993 [JP] Japan 5-331000

[51] **Int. Cl.⁷** H01M 10/46[52] **U.S. Cl.** 320/136; 320/132[58] **Field of Search** 320/116, 121, 320/125, 132, 134, 136, 149, 160[56] **References Cited****U.S. PATENT DOCUMENTS**

5,834,922 11/1998 Ikawa et al. 320/136

FOREIGN PATENT DOCUMENTS

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Primary Examiner—Edward H. Tso*Attorney, Agent, or Firm*—R. William Beard, Jr.; Frohwitter[57] **ABSTRACT**

The present invention provides a distributed secondary battery type power storage system capable of maintaining the soundness of the secondary battery and of efficient electric power charging and discharging operations. The secondary battery power storage system comprises a secondary battery connected to a load, a charge/discharge unit connectable to a power system and connected to the secondary battery, and a plurality of loads connected to the charge/discharge unit. A power receiving object is selected and a capacity is determined on the basis of information about the operating condition of the plurality of loads, and the surplus electric power remaining in the secondary battery after feeding electric power from the secondary battery to the load is fed to the selected power receiving object through the charge/discharge unit. The secondary battery power storage system is capable of maintaining the soundness of the secondary battery and of efficient charging and discharging operation.

4 Claims, 6 Drawing Sheets

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March 8, 2004